Space Weather Forecast

Issued on Tuesday, 05 March 2024 at 01:12 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of isolated Moderate flares throughout. Slight chance of G1/Minor Storm conditions on Days 3 and 4 (07 and 08 Mar).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Low. There are currently ten sunspot regions on the visible disc, with the majority of regions appearing simple and stable at this time. The most complex regions are located in the northwest and northeast, the latter developing slowly but is notable for its uncommon north-south magnetic alignment.

No Earth-directed Coronal Mass Ejections (CMEs) were observed.

Solar Wind / Geomagnetic Activity: Solar winds parameters indicated the ongoing, but gradually waning effects of one or more combined CMEs that arrived at Earth on 03 Mar. Solar wind speeds were largely at background levels but became slightly elevated late in the UTC day on 04 Mar. Total magnetic field strength, IMF, was moderate throughout. The north-south component varied between moderately positive and negative, with a mostly positive (northward) direction. Resultant Geomagnetic activity was Active (Kp4) from 04/0000-0300 UTC, but Quiet (Kp1-2) through the remainder of the period.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background levels with no radiation storms observed.

Aurora: Sightings of Aurora were documented across the UK and even to southern parts of England whilst looking northward at elevation on the evening of 03 Mar during the peak of the geomagnetic storm. This was aided by the largely clear skies across the UK at the time. Aurora sightings have declined significantly since then.

Four-Day Space Weather Forecast Summary

Solar Activity: Low with a chance of isolated Moderate activity, reducing to a slight chance by Day 4 (08 Mar).

Solar Wind / Geomagnetic Activity: A CME that left the sun on 03 Mar has a chance to give glancing impacts at Earth on Day 3 (07 Mar). No other CMEs feature in the forecast period. Residual effects from the CME that arrived on 03 Mar should diminish on Day 1 (05 Mar) with background to slightly enhanced solar winds expected to persist for much of, if not throughout the following days. A coronal hole high-speed stream enhancement is likely to occur late on Day 4 (08 Mar) with speeds predicted to increase to slightly elevated or elevated levels at peak.

Quiet to Unsettled geomagnetic activity is expected Day 1 (05 Mar), easing to Quiet from Day 2 (06 Mar). Activity may increase on Day 3 (07 Mar) with a chance of Unsettled to Active intervals and a slight chance of peak G1/Minor Storms if any CME enhancement occurs. On Day 4 (08 Mar) activity should increase late in the day to become Unsettled to Active, with a slight chance of G1/Minor Storm conditions.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy

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protons) is expected to persist at background levels, but with a very slight chance of rising above the S1/Minor Radiation Storm threshold should any significant flares occur from the numerous sunspots that occupy the western disc.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	10	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	30	30	30	20
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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